UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,993	01/29/2004	Hidenori Nanki	56937-106	2852

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EXAMINER
STIGLIC, RYAN M

ART UNIT	PAPER NUMBER
2112	

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/765,993	NANKI ET AL.
	Examiner	Art Unit	
	Ryan M. Stiglic	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-36* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-4, 11-22 and 29-36* is/are rejected.
7) ☒ Claim(s) *5-10 and 23-28* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>29 January 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All   b)☐ Some *   c)☐ None of:
        1. ☒ Certified copies of the priority documents have been received.
        2. ☐ Certified copies of the priority documents have been received in Application No. _____.
        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-36 are pending and have been examined.

2.   Claims 1-4, 11-22, and 29-36 are rejected.

3.   Claims 5-10 and 23-28 are objected to.

Priority

4.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Claim Objections

5.   Claim 10 is objected to because of the following informalities: Claim 10 contains

references to "the second data holding step" and "the first data holding step" prior to recitation of

a first or second holding step. The Examiner will treat "proceed to the second data holding step"

as "proceed to a second data holding step" and "proceed to the first data holding step" as

"proceed to a first data holding step". Appropriate correction is required.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1-4, 11-12, 19-22, and 29-30 are rejected under 35 U.S.C. 102(b) as being

anticipated by Kwon (US5768546)).

Claims 1-18 are substantially equivalent to claims 19-36 in that claims 1-18 represent the method

of operating the apparatus of claims 19-36. As such, claims 19-36 will be rejected on the same

basis as those presented for claims 1-18.

For claims 1 and 19:

A data transmission method, which processes data through an N-bit bus, comprising the steps of:

- converting M-bit format data to N-bit format data (Fig. 2; col. 3, ll. 19-25; col. 3, line 58

  – col. 4, line 36); and

- transmitting the converted N-bit format data to a data processing device (Fig. 2; col. 3, ll.

  19-25; col. 3, line 58 – col. 4, line 36).

For claims 2 and 20:

A data transmission method, which processes data through an N-bit bus, comprising the steps of:

- transmitting N-bit format data from a data processing device (Fig. 2; col. 3, ll. 19-25; col.

  3, line 58 – col. 4, line 36); and

- converting the transmitted N-bit format data to M-bit format data (Fig. 2; col. 3, ll. 19-25;

  col. 3, line 58 – col. 4, line 36).

For claims 3 and 21:

A data transmission method, which processes data through an N-bit bus, comprising the steps of:

- converting N-bit format data to M-bit format data (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36); and

- writing the converted M-bit format data in a buffer memory (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36).

For claims 4 and 22:

A data transmission method, which processes data through an N-bit bus, comprising the steps of:

- reading M-bit format data from a buffer memory (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36); and

- converting the M-bit format data thus read to N-bit format data (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36).

For claims 11 and 29:

A data transmission method, which processes data through an N-bit bus, comprising a multi-format conversion step of:

- dividing M-bit (16) format data into packets of s-bits (8) that correspond to the greatest common measure of M (16) and N (32) (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36); and

- converting q-number (4) of data having an M-bit format constituted by s (8) bits × p (2) packets to p-number (2) of data having an N-bit format constituted by s bits × q packets, by using r-number of packets corresponding to the least common multiple of M ÷ s =p

and N ÷ s=q as one unit (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36; as shown in Figure 2 the 2nd FIFO contains a plurality (4) of data [containing 8 packets] in a 16-bit format that are converted into a plurality of data (2) [containing the same 8 packets] in a 32-bit format and stored in a 1st FIFO).

For claims 12 and 30:

A data transmission method, which processes data through an N-bit bus, comprising a multi-format conversion step of:

- dividing N-bit (32) format data into packets of s-bits (8) that correspond to the greatest common measure of N (32) and M (16) (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36); and

- converting p-number (2) of data having an N-bit format constituted by s bits (8) × q (4) packets to q-number of data having an M-bit format constituted by s bits × p packets, by using r-number of packets corresponding to the least common multiple of M ÷ s=p and N ÷ s=q as one unit (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36; as shown in Figure 2 the 1st FIFO contains a plurality (2) of data [containing 8 packets] in a 16-bit format that are converted into a plurality of data (4) [containing the same 8 packets] in a 32-bit format and stored in a 2nd FIFO).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 13-18 and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon as applied to claims 1-4, 11-12, 19-22, and 29-30 above, and further in view of Sound On Sound "More Bits For Your Bucks".

Kwon teaches a data transmission method and apparatus for bi-directional transfer of data between two buses with different widths. In particular Kwon teaches converting M-bit format data to N-bit format data (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36); and transmitting the converted N-bit format data to a data processing device (Fig. 2; col. 3, ll. 19-25; col. 3, line 58 – col. 4, line 36). Kwon further teaches that M-bit (16) data is converted to N-bit (32) data through the use of common size byte packets that are transferred between buffer memories. Kwon continues to teach, "One of ordinary skill in the art can use the teachings of the present invention to other devices requiring bi-directional transfer of data between buses with different data word width."

Sound On Sound (hereinafter SOS) teach of the Terratec EWS88MT PCI Soundcard for the PC. The EWS88MT supports 24-bit, 96kHz digital audio signals for superior sound quality. With such a high quality data format there is a huge increase in the amount of data being shunted to and fro. In order to fully maximize transactions on the 32-bit PCI bus (to which the sound card connects) four 24-bit words may be 24-bit packed into a stream of 32-bit PCI transactions (page 2). "All transfers across the PCI buss are 32 bits wide, so 24-bit packed transfers send 24 bits of

the first sample and the first 8 bits of the second, followed by the final 16 bits of the second and

the first 16 bits of the third, the final 8 bits of the third followed by the entire 24 bits of the

fourth, and so on (page 2)."

It would have been obvious to one of ordinary skill in the art at the time of the applicant's

invention to implement the 24-bit audio data of SOS as M-bit data of Kwon such that the audio

data can be easily converted into 32-bit bus compliant data using four 8-bit packets that

maximize transfers across the 32-bit bus.

Allowable Subject Matter

10.   Claims 5-10 and 23-28 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

The Examiner has done a thorough search and found no prior art of record, alone or in

combination, that teaches or fairly suggests the limitation, "wherein with respect to a conversion

system from the M-bit format data to the N-bit format data, first data constituted by first, second

and third packets, second data constituted by fourth, fifth and sixth packets, third data constituted

by seventh, eighth and ninth packets and fourth data constituted by tenth, eleventh and twelfth

packets are inputted, the method comprising: a first control process of outputting fifth data

constituted by the first, fourth, second and fifth packets; a second control process of outputting

sixth data constituted by the third and sixth packets; a third control process of outputting seventh

data constituted by the seventh, tenth, eighth and eleventh packets; a fourth control process of

outputting eighth data constituted by the ninth and twelfth packets; and a fifth control process of

inputting the sixth data and the eighth data and outputting ninth data constituted by third, sixth,

ninth and twelfth packets." Instead the Examiner has found prior art, such as Sound On Sound,

that teach of processing four consecutive 24-bit words into three consecutive 32-bit words. In

other words, "24-bit packed transfers send 24 bits of the first sample and the first 8 bits of the

second, followed by the final 16 bits of the second and the first 16 bits of the third, the final 8

bits of the third followed by the entire 24 bits of the fourth, and so on." The Examiner was thus

unable to find a suitable reference that taught and/or fairly suggested selectively choosing two

bytes from first through fourth 24-bit words and creating two 32-bit words with a third 32-bit

word consisting of the remaining bytes of the first through fourth 24-bit words.

Conclusion

11.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure because it teaches various methods of converting between buses of different widths.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Ryan M. Stiglic whose telephone number is 571.272.3641. The

examiner can normally be reached on Monday - Friday (6:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Rehana Perveen can be reached on 571.272.3676. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PAUL R. MYERS
PRIMARY EXAMINER

RMS